

Jpn. J. Ent., **62** (3): 421–431. September 25, 1994

A New Species of the Genus *Agriotypus* (Hymenoptera, Ichneumonidae) from Japan

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Abstract *Agriotypus silvestris* n. sp. is described from Japan and a key to the world species of the genus is also given.

Key Words: *Agriotypus*; new species; taxonomy; Ichneumonidae; Agriotypinae.

Agriotypus CURTIS is the only genus composing the Agriotypinae of the Ichneumonidae. This genus is known as the parasitoid of Trichoptera and the recorded hosts are belonging to the Goeridae, the Limnephilidae and the Odontoceridae. Up to the present, 8 species have been described from the Palearctic and the Oriental Regions, *i.e.* *A. armatus* CURTIS, 1832 from Europe, *A. gracilis* WATERSTON, 1930 from Japan, *A. himalensis* MASON, 1971 from India, *A. kambaitensis* GUPTA *et* CHANDRA, 1975 from Burma, *A. townesi* CHIU, 1986 from Taiwan and *A. changbai-shanus* CHAO, 1981, *A. jilinensis* CHAO, 1981 and *A. lui* CHAO, 1986 from China.

In Japan, only one species, *A. gracilis* has been recorded and known as the parasitoid of *Goera japonica* BANKS, 1906. In April of 1991, Mr. T. NOZAKI collected the cases of a limnephilid caddisfly, *Neophylax* sp. NA of TANIDA (1985), parasitized by *Agriotypus* species in Kita-akigawa River in western Tokyo. He and the junior author obtained additional specimens parasitizing on the caddisfly case in Kita-asakawa River in western Tokyo in November, 1991 and March, 1992. Since it has been unknown that *A. gracilis* is parasitic on *Neophylax* species, we examined the specimens and found that they are distinct from *A. gracilis* in the shape of clypeus. We compared the species also with the holotypes of three Chinese species and *A. himalensis*, the identified specimens of *A. armatus* and the descriptions of two Oriental species, and decided that it is new to science.

Genus *Agriotypus* CURTIS

Agriotypus CURTIS, 1832, British Entomology, 3: 389. Type species: *Agriotypus armatus* CURTIS; original designation.

Crotopus HOLMGREN, 1858, Ofvers. Svenska Vetensk. Akada. Förth., 15: 353. Type species: (*Crotopus abnormis* HOLMGREN)=*armatus* CURTIS; monobasic.

Generic descriptions are referred to TOWNES (1969) and GUPTA & CHANDRA (1975).

***Agriotypus silvestris* n. sp.**

(Figs. 1, 2 A, 2 B, 3 & 4)

♀. Head (Figs. 1 A–C) 1.8–2.0 times as wide as long; in dorsal view, posterior margin of head emarginate medially and temple strongly curved but not much convergent behind eye, 0.9–1.3 times as long as eye; occiput closely punctate with dense

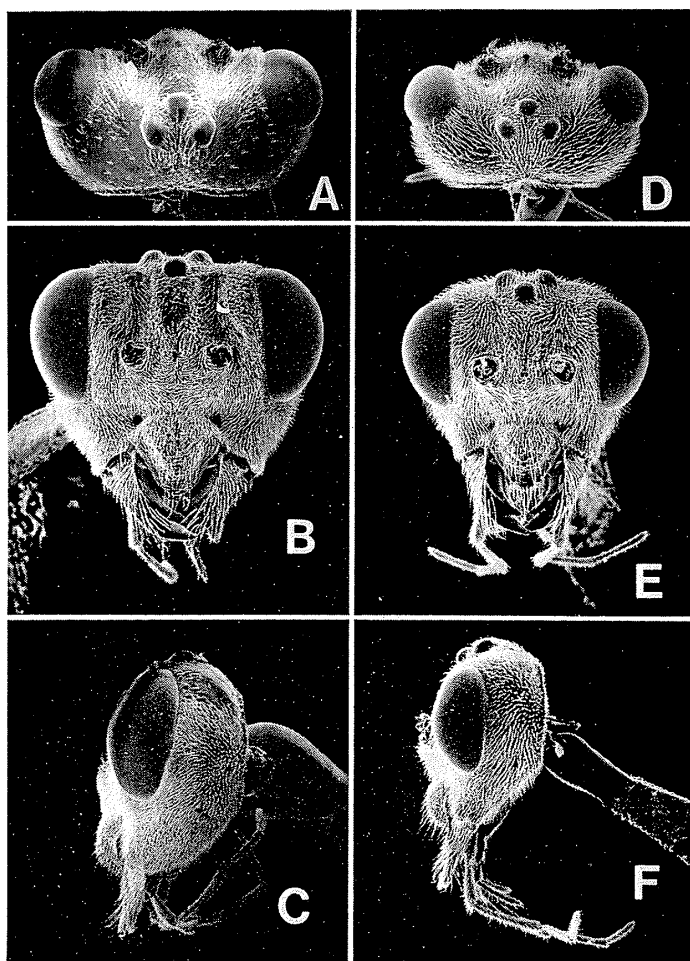


Fig. 1. Heads of *Agriotypus silvestris* n. sp. A–C, Females; D–F, males; A & D, dorsal views; B & E, frontal views; C & F, lateral views.

hairs; occipital carina complete; vertex longitudinally puncto-strigate with sparse hairs on median portion and smooth with widely scattered punctures and hairs on lateral portion; $POL/OOL=0.4-0.7$; ocellar area punctate rugose with moderately dense hairs; upper face with antennal scrobe, densely and strongly punctate with moderately dense hairs except median raised area rugose with sparse punctures and hairs, with weak longitudinal carina along inner orbit, with or without a pair of weak longitudinal carinae on median raised area; temple, gena and lower face closely punctate with dense hairs; lower face 3.6–4.7 times as wide as long; clypeus 1.0–1.2 times as wide as long, roundly convex without angulation, closely punctate with dense hairs on basal 2/3 and trans-strigate with moderately dense hairs on apical 1/3, with apical margin strongly convex and truncate; flagellum 21–23-segmented; 1st flagellomere 1.5–1.8 times as long as the 2nd; mandible with upper tooth much shorter than lower tooth, densely punctate with long hairs on basal 2/3 of outer surface and smooth on apical 1/3 of outer surface.

Mesosoma (Figs. 2 A & 4 A–C): Pronotum closely punctate with dense hairs except dorsal 1/2 of lateral portion longitudinally strigose to reticulate rugose without hairs, with weak epomia; propleuron closely punctate with dense hairs; mesoscutum (Fig. 2 A) 1.0–1.1 times as long as wide, densely punctate with moderately dense hairs except median 1/3 of posterior half smooth with widely scattered punctures and hairs, with sharp notaulus extending to anterior 2/3 of mesoscutum; scutellum with lateral carina extending to the posterior end, the posterior end produced dorso-posteriorly to form a slender and weakly up-curved spine tapering toward apex (Fig. 4 A), longitudinally puncto-strigate with sparse hairs on dorsal surface and closely punctate with dense hairs on ventral side of spine and lateral surface

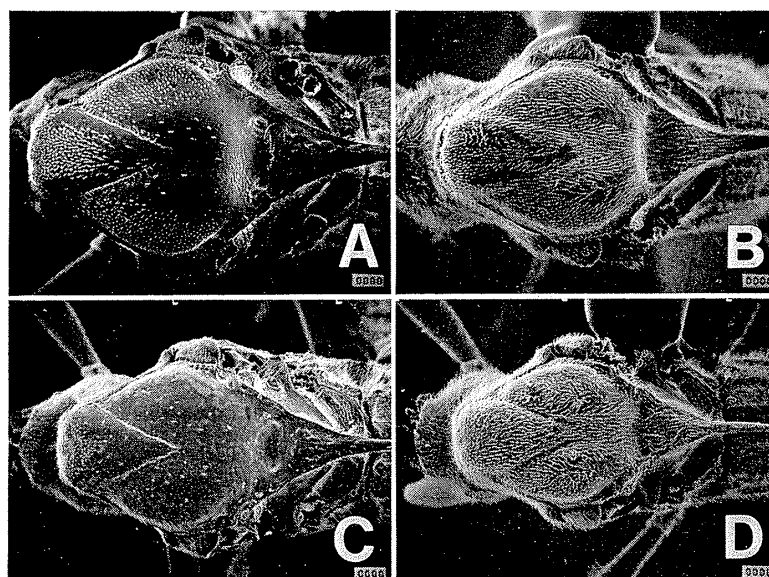


Fig. 2. Dorsal views of mesonota of *Agriotypus* spp. A & B, *A. silvestris* n. sp.; C & D, *A. gracilis* WATERSTON; A & C, females; B & D, males.

except apical half of spine smooth; axillary trough of mesonotum closely punctate with dense hairs; tegula sparsely punctate with sparse hairs on anterior 2/3 and smooth without hairs on posterior 1/3; mesopleuron closely punctate with dense hairs except median 1/3 of lateral surface longitudinally puncto-strigate with sparse hairs, epicnemium with a short vertical carina opposite ventral 1/4 to ventral corner of pronotum, sternaulus distinct and complete; metanotum with moderately dense hairs, postscutellum anteriorly pointed triangular with lateral carina, axillary trough with weak longitudinal carinae; metapleuron closely punctate with dense hairs, with strong juxtacoxal carina on posterior 1/3; propodeum closely punctate with dense

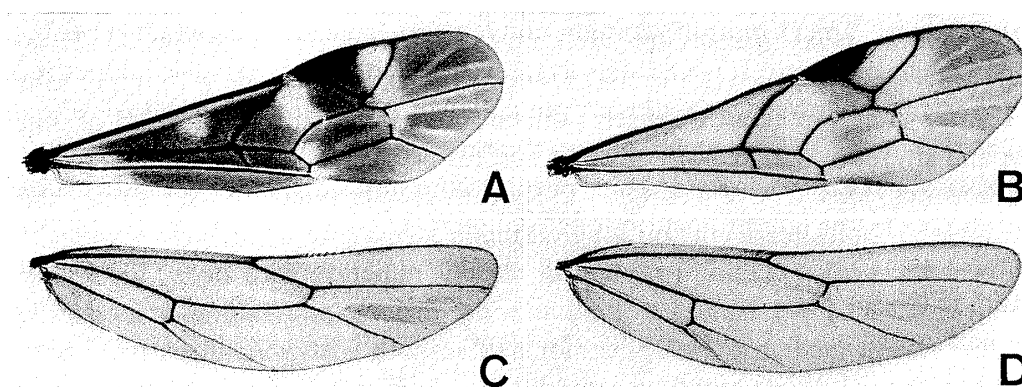


Fig. 3. Wings of *Agriotypus silvestris* n. sp. A & C, Females; B & D, males; A & B, forewings; C & D, hindwings.

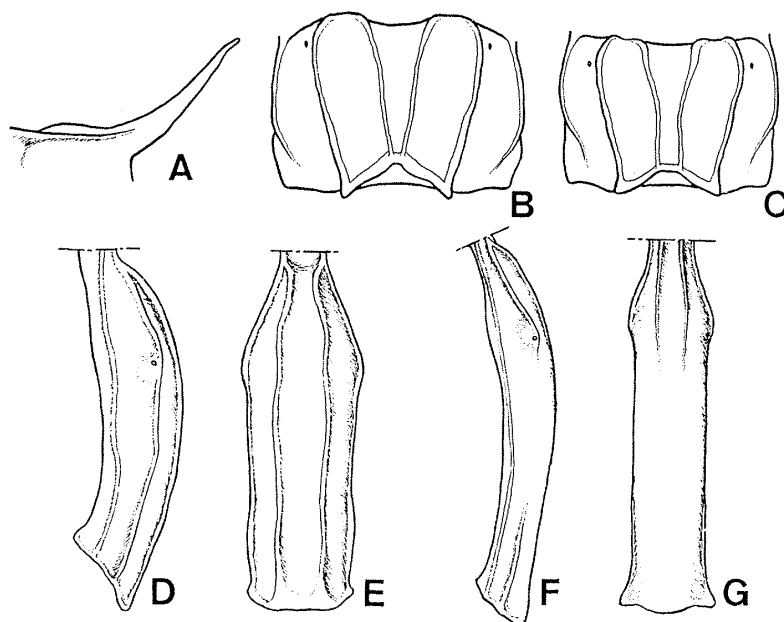


Fig. 4. *Agriotypus silvestris* n. sp. A, Lateral view of scutellum; B & C, dorsal views of propodea; D–F, 1st metasomal segments; D & E, females; F & G, males; D & F, lateral views; F & G, dorsal views.

hairs, with median and lateral longitudinal carinae strong and pleural carina strong anteriorly and weak posteriorly; median longitudinal carinae of propodeum convergent posteriorly, almost straight (Fig. 4 B) or curved near middle, when curved, strongly convergent on anterior half and weakly convergent on posterior half (Fig. 4 C).

Wings (Figs. 3 A & 3 C): Forewing (Fig. 3 A) covered with hairs except basal about 1/5 of cell A bare; vein lcu-a varying from opposite to separation of veins M and Cu to distad the separation by half of cu-a length; vein 2m-cu distad separation of veins Rs and M by 1.3–5.6 times length of Rs between the separation and vein r-rs; 3r-m absent. Hindwing (Fig. 3 C) entirely covered with hairs, with 6–10 distal hamuli; length of vein Cu between veins M and cu-a/length of vein cu-a=1.4–4.4.

Legs: Coxae closely punctate with dense hairs; trochanters, femora and tibiae moderately densely punctate with moderately dense hairs; tibial spurs short, fore tibial spur about 1/5 times as long as fore basitarsus; tarsi with dense hairs; tarsal claws long and curved with arolia small; hind femur 5.8–7.0 times as long as depth at middle; hind 5th tarsomere 2.6–3.3 times as long as the 4th.

Metasoma moderately densely punctate with moderately dense hairs; 1st segment closely punctate with dense hairs, 2.8–3.9 times as long as apical width, with median dorsal, dorso-lateral and ventro-lateral carinae complete (Figs. 4 D & 4 E); 2nd and 3rd terga fused; 2nd tergum anteriorly without longitudinal carinae; 2nd and 3rd sterna fused; 2nd sternum with anterior margin raised and subtending some longitudinal carinae; ovipositor sheath about 1/5 times as long as hind tibia, polished with sparse punctures and hairs.

Color: Black to blackish brown; tarsal claws and ovipositor reddish brown; hairs yellowish white. Wings hyaline and tinged with brown as in Figs. 3 A & 3 C; veins and stigma brown to blackish brown.

Length of forewing: 3.9–6.2 mm.

♂. Similar to ♀ except for the following characters: median portion of vertex, ocellar area and upper face densely punctate with moderately dense hairs (Figs. 1 D–F); lateral portion of vertex moderately densely punctate with moderately dense hairs; flagellum 28–32-segmented; pronotum with dorsal 1/2 of lateral portion sparsely to moderately densely punctate with moderately dense hairs; mesoscutum moderately densely and evenly punctate with moderately dense hairs (Fig. 2 B); scutellum moderately densely punctate with moderately dense hairs except apical half of spine smooth and bare; hind femur 6.5–7.2 times as long as depth at middle; hind 5th tarsomere 1.9–2.5 times as long as the 4th; 1st metasomal segment slender, 5.0–5.5 times as long as apical width, with median dorsal carina present only on anterior 1/3 and median 1/3 of dorsolateral carina absent (Figs. 4 F & 4 G); 2nd and 3rd metasomal sterna not fused; hypopygium as in Fig. 5 D; genitalia (Fig. 5 A–C) with digitus elongate; color of forewing pale as in Fig. 3 B.

Holotype: ♀, Kannonzawa, Misumai, Sapporo, Hokkaido, 11–22. viii. 1992, Malaise trap, N. KUHARA. In National Institute of Agro-Environmental Sciences.

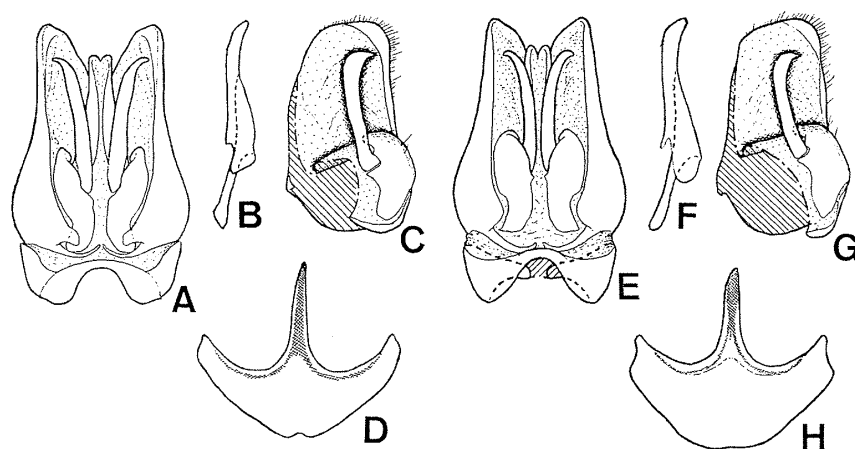


Fig. 5. Male genitalia and hypopygia of *Agriotypus* spp. A–D, *A. silvestris* n. sp.; E–H, *A. gracilis* WATERSTON; A & E, ventral views; B & F, lateral views of aedeagi; C & G, median views of parameres; D & H, ventral views of hypopygia.

Paratypes: [Hokkaido] same locality as holotype: 26 ♀ (11–22. viii. 1992), 2 ♀ (22. viii–3. ix. 1992), 1 ♂ (3–15. ix. 1992) and 1 ♀ (24. viii–7. ix. 1993), N. KUHARA, Malaise trap. [Honshu] Karasuzawa, Okawahara, Kuroishi, Aomori Pref.: 1 ♀ (3. iii. 1993), 1 ♀ (10. iii. 1993) and 1 ♀ (24. iii. 1993), M. AOYAGI, emerged from the cases of *Neophylax ussuriensis*. Kita-akigawa River, Koiwa, Hinohara, Tokyo: 1 ♂ 2 ♀ (2. vii. 1991), 6 ♀ (26. vii. 1991), 1 ♀ (5. ix. 1991), 1 ♀ (24. ix. 1991) and 2 ♂ 1 ♀ (23. x. 1991), T. NOZAKI, taken out from the cases of *N. sp. NA*; 2 ♂ (31. x–5. xi. 1991), 1 ♂ (8. xi. 1991), 3 ♀ (13–14. xi. 1991), 1 ♀ (21. xi. 1991), 1 ♂ (22–25. xi. 1991) and 1 ♂ (30. xii. 1991–4. i. 1992), T. NOZAKI, emerged from the cases of *N. sp. NA*. Kita-asakawa River, Shimo-ongata, Hachioji, Tokyo: 1 ♀ (27. ix. 1991), T. NOZAKI, taken out from the case of *N. sp. NA*; 1 ♂ (7. ix. 1992), 1 ♀ (18. xi. 1992), 1 ♀ (21. xi. 1992) and 1 ♀ (12. xii. 1992), M. AOYAGI & T. NOZAKI, emerged from the cases of *N. sp. NA*. Inakoyu, Mt. Yatsu, Nagano Pref.: 1 ♀ 1 ♂ (14. viii. 1975), O. YATA. Kibune River, Kibune, Kyoto: 1 ♂ (22. v. 1992) and 1 ♀ (5. i. 1993), M. AOYAGI, taken out from the cases of *N. japonicus*; 1 ♀ (3. x. 1992) and 2 ♀ (7. x. 1992), M. AOYAGI, emerged from the cases of *N. japonicus*.

Host: *Neophylax ussuriensis* (MARTYNOV, 1914), *N. japonicus* SCHMID, 1964 and *N. sp. NA* (Trichoptera: Limnephilidae).

Distribution. Japan (Hokkaido, Honshu).

Biology: Three *Neophylax* species are recorded as the hosts (see above). Life history is not clear. This species occurs more upstream than *A. gracilis*, although both species are found in the same stream (e.g., Kannonzawa in Sapporo and Kita-asakawa River in Tokyo). Sex ratio is highly biased toward female.

Remarks. This species resembles European *A. armatus* in the characters of head such as the rounded temple and the roundly convex clypeus, but easily distinguished from the later by the presence of smooth area on mesonotum in female and

the slender 1st metasomal segment in male. In having the smooth area of mesoscutum in female (Figs. 2 A & 2 C), this species seems to be closely related to Japanese *A. gracilis* and Chinese *A. changbaishanus*. And these three species are related to *A. armatus* in having the elongate digitus (Figs. 5 A, 5 C, 5 E & 5 G).

This is the ninth species of *Agriotypus* in the world and they can be distinguished by the following key.

Key to the World Species of *Agriotypus*

(Females of *A. kambaitensis*, *A. jilinensis* and *A. townesi* are unknown)

1. Females 2
- Males 6
2. Clypeus weakly convex; 2nd metasomal tergum anteriorly with longitudinal carinae; spine of scutellum produced posteriorly (Fig. 7 E) 3
- Clypeus weakly to strongly convex; 2nd metasomal tergum anteriorly without longitudinal carinae; spine of scutellum produced dorso-posteriorly (Figs. 7 A–D) 4
3. Clypeus with angulation; tibiae and tarsi paler than body color, reddish yellow *A. himalensis* MASON
- Clypeus roundly convex, without angulation; tibiae and tarsi same color as in

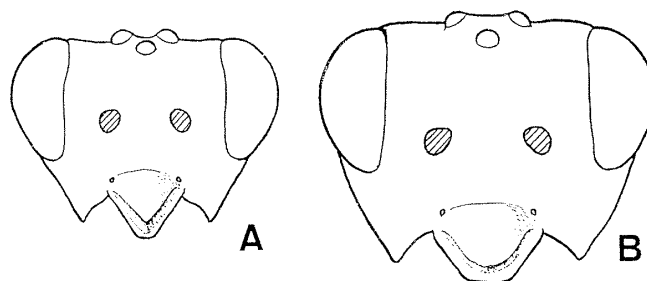


Fig. 6. Frontal views of heads of *Agriotypus* spp. A, *A. gracilis* WATERSTON; B, *A. changbaishanus* CHAO.

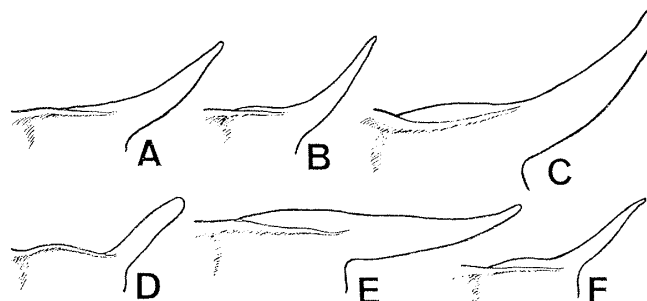


Fig. 7. Lateral views of scutella of *Agriotypus* spp. A, *A. armatus* CURTIS; B, *A. gracilis* WATERSTON; C, *A. changbaishanus* CHAO; D, *A. jilinensis* CHAO; E, female of *A. lui* CHAO; F, male of *A. lui* CHAO.

- body, reddish brown *A. lui* CHAO
4. Mesoscutum entirely covered with punctures and hairs *A. armatus* CURTIS
- At least median 1/3 of posterior half of mesoscutum smooth with widely scattered punctures and hairs (Figs. 2 A & 2 C) 5
5. Clypeus roundly convex, without angulation (Figs. 1 B & 1 C)
..... *A. silvestris* n. sp.
- Clypeus with angulation (Figs. 6 A & 6 B) 13
6. 2nd metasomal tergum anteriorly with longitudinal carinae 7
- 2nd metasomal tergum anteriorly without longitudinal carinae 10
7. 1st metasomal segment very slender, 7.9 times as long as apical width, with median dorsal carina incomplete and dorso-lateral carina absent (Figs. 9 I & 9 J) *A. lui* CHAO
- 1st metasomal segment not so slender, 4.2–6.5 times as long as apical width; with median dorsal and dorso-lateral carinae complete 8
8. Tibiae and tarsi paler than body color, reddish yellow
..... *A. himalensis* MASON
- Tibiae and tarsi same color as in body, brownish black to black 9
9. 1st metasomal segment more slender, 6.5 times as long as apical width; spine of scutellum weakly curved *A. kambaitensis* GUPTA *et* CHANDRA
- 1st metasomal segment less slender, 4.2 times as long as apical width; spine of scutellum produced dorsally and almost straight *A. townesi* CHIU
10. Clypeus roundly convex, without angulation (Figs. 1 E & 1 F) 11
- Clypeus weakly to strongly convex with angulation (Figs. 6 A & 6 B) 12
11. 1st metasomal segment slender, 5.0–5.5 times as long as apical width (Figs. 4 F & 4 G) *A. silvestris* n. sp.
- 1st metasomal segment stout, 3.5–3.7 times as long as apical width (Figs. 9 A

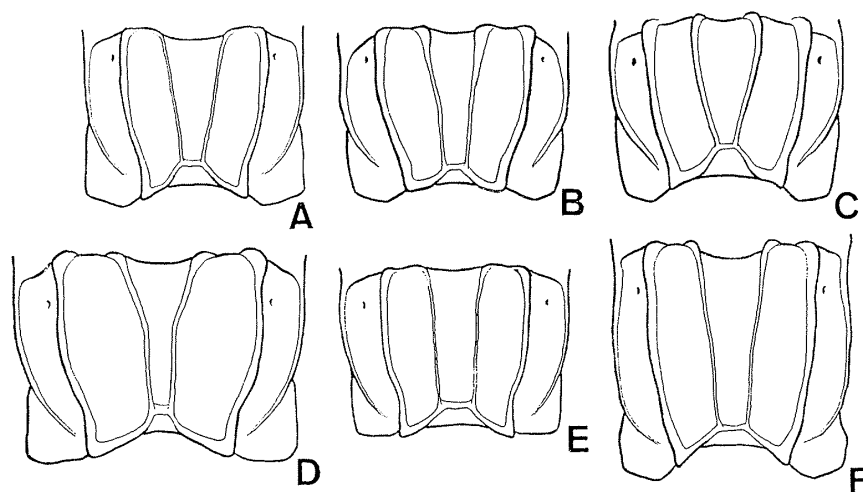


Fig. 8. Dorsal views of propodea of *Agriotypus* spp. A, *A. armatus* CURTIS; B & C, *A. gracilis* WATERSTON; D, *A. changbaishanus* CHAO; E, *A. jilinensis* CHAO; F, *A. lui* CHAO.

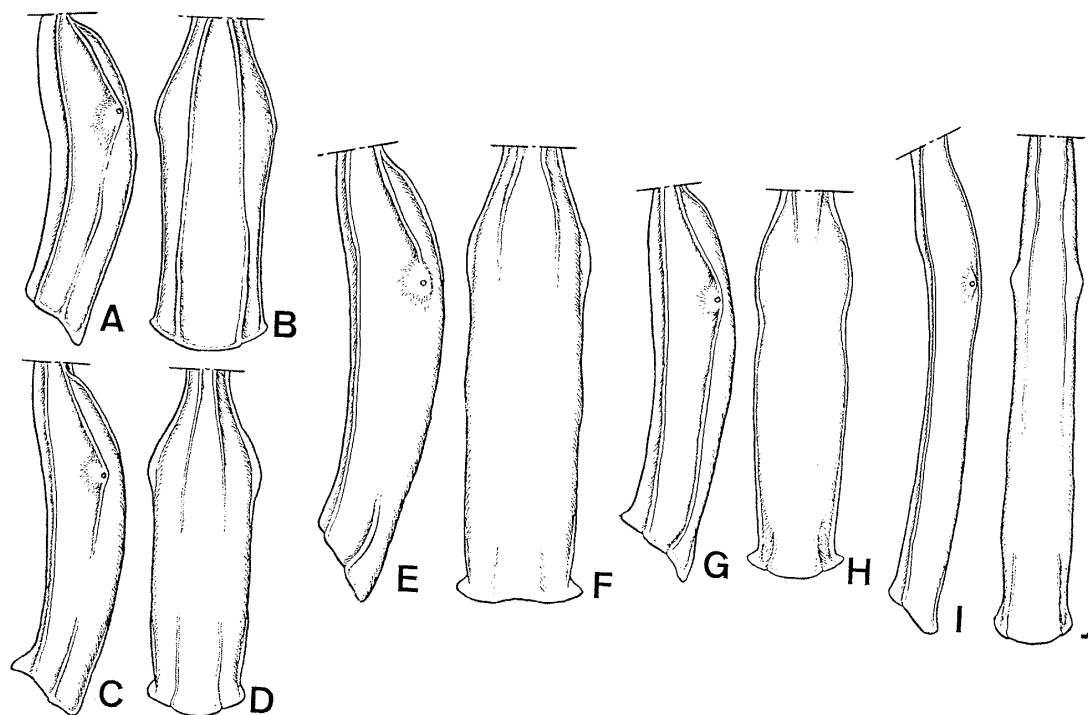


Fig. 9. First metasomal segments of males of *Agriotypus* spp. A & B, *A. armatus* CURTIS; C & D, *A. gracilis* WATERSTON; E & F, *A. changbaishanus* CHAO; G & H, *A. jilinensis* CHAO; I & J, *A. lui* CHAO; A, C, E, G & I, lateral views; B, D, F, H & J, dorsal views.

- & 9 B) *A. armatus* CURTIS
12. Spine of scutellum depressed laterally, almost straight, dorsal and ventral margins parallel with apex rounded in lateral view (Fig. 7 D); median dorsal carinae of propodeum parallel (Fig. 8 E); 1st metasomal segment with dorso-lateral carina complete (Fig. 9 G); digitus stout *A. jilinensis* CHAO
- Spine of scutellum not depressed, weakly up-curved and tapering toward rounded apex (Figs. 7 B & 7 C); median dorsal carinae of propodeum convergent posteriorly (Figs. 8 B–D); 1st metasomal segment with dorso-lateral carina incomplete medially (Figs. 9 C & 9 E); digitus elongate (Figs. 5 E & 5 G) 13
13. Smaller species, length of forewing 4.3–5.7 mm; clypeus strongly convex, 1.0–1.3 times as wide as long, angulation pointed ventrally in frontal view (Fig. 6 A); median dorsal carina of propodeum evenly convergent posteriorly (Fig. 8 B) or weakly convergent on anterior half and strongly convergent on posterior half (Fig. 8 C); ovipositor sheath 0.3 times as long as hind tibia
..... *A. gracilis* WATERSTON
- Larger species, length of forewing 6.8–6.9 mm; clypeus weakly convex, 1.4 times as wide as long, angulation rounded ventrally in frontal view (Fig. 6 B); median dorsal carina of propodeum strongly convergent posteriorly on an-

terior half and weakly convergent on posterior half (Fig. 8 D); ovipositor sheath 0.5 times as long as hind tibia *A. changbaishanus* CHAO

Specimens Examined

A. armatus: [Europe] 1 ♂, Uppsala, Sweden, 25. v. 1912, A. ROMAN; 1 ♀, Rostock, Mecklenburg, Germany, 18. v. 1889, BRAUNS; 1 ♂, Estenos, Haute-Garonne, France, 9. x. 1950, F. SCHMID.

A. gracilis: [Japan] 2 ♀, Kannonzawa, Misumai, Sapporo, Hokkaido, 25. v.–9. vi. 1993, Malaise trap, N. KUHARA; 1 ♀ 1 ♂, Nagaki River, Odate City, Akita Pref., 29. ix. 1992, em. 22–23. x. 1992, M. AOYAGI; 2 ♀, Kita-asakawa River, Hachioji City, Tokyo, 22. iii. 1992, em. 22. iii.–20. vi. 1992, K. KONISHI; 1 ♀ 2 ♂, Asakawa, Tokyo, 29. iv. 1940, T. ISHIHARA; 1 ♂, Juriki, Okutama, Tokyo, 12. v. 1974, S. KATSUYA; 1 ♂ (16. iii. 1989), 1 ♂ (30. iii. 1989), 1 ♂ (21. vi. 1989, em. 26. vi. 1989), 1 ♂ (5. ix. 1991, em. 1. xi. 1991) & 1 ♀ (5. ix. 1991, em. 9. ix. 1991), Minoo City, Osaka Pref., M. AOYAGI; 4 ♀ 2 ♂, Yamaguni River, Yamaguni-machi, Oita Pref., 14. x. 1992, em. 20–25. xi. 1992, Y. NAGAYASU; 2 ♀ 2 ♂, Asono River, Syonai-machi, Oita Pref., 16. x. 1992, em. 11–25. xi. 1992, M. UENISHI. This is the first record of this species from Kyushu.

A. himalensis: [India] 1 ♀ (holotype) 2 ♂ (paratypes), Jhum La, Kameng, NEFA, 17. ix. 1961, F. SCHMID.

A. changbaishanus: [China] 1 ♀ (holotype) 1 ♂ (allotype), Changbaishan Natural Reserve, Jilin Province, 24. vi. 1979, Y. ZHANG.

A. jilinensis: [China] 1 ♂ (holotype), Changbaishan Natural Reserve, Jilin Province, 25. vi. 1980, Y. ZHANG.

A. lui: [China] 1 ♀ (holotype, 11. iv. 1984) & 1 ♂ (allotype, 10. iv. 1985), Fuzhou, Fujian Province, S. YI.

Acknowledgments

We would like to thank Mr. T. NOZAKI (Environ. Res. Center of Kanagawa Pref.) and Mr. N. KUHARA (Hokkaido Univ.) for their collections of valuable materials, Prof. H. CHAO (Fujian Agric. College), Dr. D. WAHL (American Ent. Inst.) and Dr. M. SHARKEY (Centre for Land and Biological Resources Research) for their allowing us to examine the specimens under their charge, Mr. E. NISHIDA for his useful advice and Drs. K. TANIDA and Y. TAKEMON (Univ. Osaka Pref.) for their valuable information. We are also grateful to Drs. M. ISHII and T. HIROWATARI (Univ. OSAKA Pref.) for their reading our manuscript.

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(Received December 9, 1993; Accepted April 15, 1994)

Jpn. J. Ent., **62** (3): 431–432. September 25, 1994

Occurrence of *Spermophagus rufiventris* BOHEMAN (Coleoptera, Bruchidae) in *Calystegia japonica* CHOISY (Convolvulaceae) Seeds

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Key words: *Calystegia japonica*; *Spermophagus rufiventris*.

Spermophagus rufiventris BOHEMAN occurs in the Belgian Congo, Caucasus, south-eastern Asia from India to Sumatra, and Taiwan, China, and Japan (MORIMOTO, 1990). In Japan, this species has been found in the wide area from Ishigaki to Hokkaido (CHUJO, 1937). It had also been reported that this species emerges from *Wistaria floribunda* DC. (Leguminosae) seeds (CHUJO, 1937). Although adults of this species were observed on flowers of *Calystegia japonica* CHOISY (CHUJO, 1937), there has been no record of